PUTTING GOALS INTO ACTION:

Evaluating New Mexico's Progress on Critical Climate Targets

September Analysis

Alex DeGolia, Director, U.S. Climate

Environmental Defense Fund

PUTTING GOALS INTO ACTION:

Evaluating New Mexico's Progress on Critical Climate Targets

Alex DeGolia
Director, U.S. Climate

TABLE OF CONTENTS

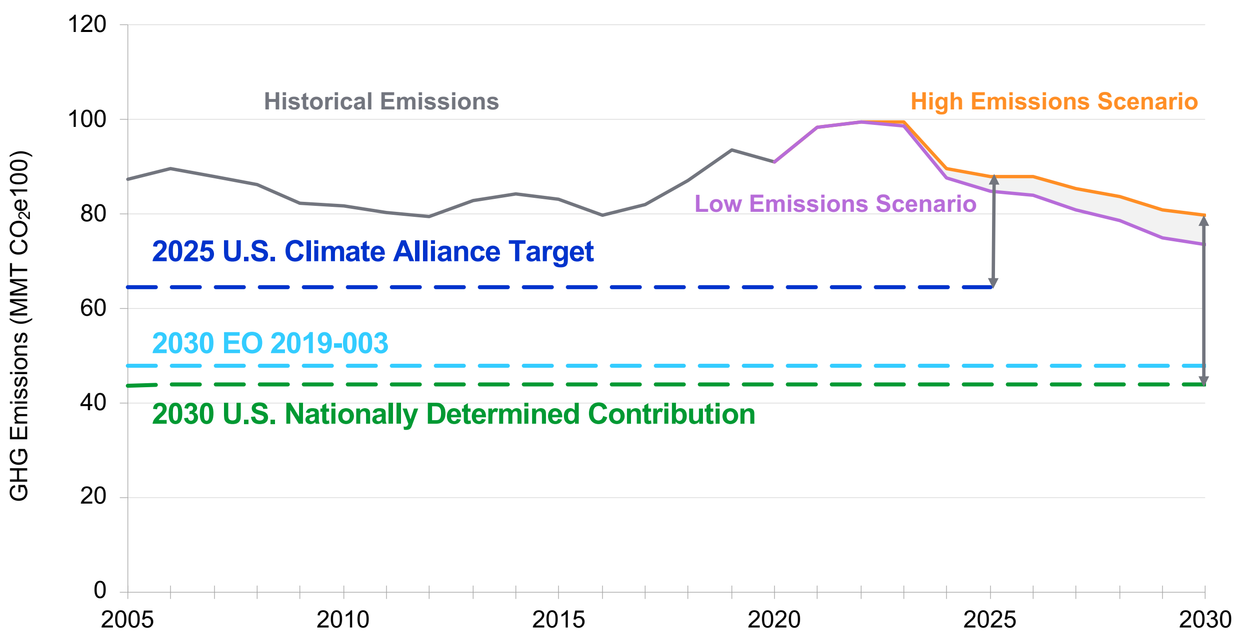
EXECUTIVE SUMMARY

In every corner of the state, New Mexicans experience the impacts of climate change. Over the past several years, the state has endured its worst wildfires in recorded history,[1] severe drought, and extreme heat, among other disasters fueled or worsened by climate change. New Mexicans can see clearly how fundamental aspects of their culture and identity are threatened — and want their state leaders to act.

To evaluate New Mexico's progress toward meeting its own climate commitments, Environmental Defense Fund (EDF) conducted an analysis of greenhouse gas emissions projections in New Mexico through 2030. The analysis used data from Rhodium Group's US Climate Service modeling released in July 2023, which reflects all policies adopted in New Mexico through June 2023, notably including updated Rhodium estimates of all greenhouse gas (GHG) emissions abatement driven by the Inflation Reduction Act. EDF adjusted data to incorporate our own estimates of oil and gas methane emissions in the state.

EDF's analysis reveals that, by 2025, New Mexico is estimated to see a 1% increase in emissions to a 3% reduction in emissions below 2005 levels. By 2030, New Mexico is estimated to see a 9% to 16% reduction below 2005 levels.[2] When compared to the state's commitments to reduce emissions by at least 26% by 2025 and 50% by 2030,[3] it is clear that the state is falling short. In other words, New Mexico faces an emissions gap — the difference between the reductions projected in the state and the amount required to meet these goals — of between 20-23 million metric tons (MMT) of carbon dioxide equivalent (CO_2e) in 2025 and 26-36 MMT CO_2e in 2030.[4]

New Mexico Economy-Wide Emissions Projections and Targets



1 https://www.santafenewmexican.com/news/local_news/hermits-peak-calf-canyon-fire-100-percent-contained-fire-officials-say/article_5ac054fc-21a1-11ed-9401-134e852ee0a8.html

2 The range of reductions estimated in 2025 and 2030 emphasizes that future emissions trajectories are uncertain and depend heavily on macroeconomic factors and fuel and clean energy costs. For more information, see Appendix 1.

3 Throughout the report we highlight both the state's 2030 45% GHG reduction target as established in Executive Order 2019-003, and its 2030 50% reduction target, which is consistent with its commitment as a member of the U.S. Climate Alliance and aligns with the U.S. Nationally Determined Contribution.

4 Greenhouse gas emissions are presented using a carbon dioxide equivalent metric to sum emissions of carbon dioxide, methane, N_2O, HFCs, PFCs, NF3, and SF6. Unless otherwise noted, throughout this report we use carbon dioxide equivalence values with a 100-year time horizon (CO_2e100) from IPCC's Fifth Assessment Report.

In addition to the analysis of the emissions gaps in 2025 and 2030, EDF evaluated the cumulative GHG emissions expected between 2020 and 2030 in New Mexico. To do so, we compare total emissions this decade to levels aligned with a declining, linear emissions trajectory assessed by the IPCC in its Sixth Assessment Report to limit global average temperature increase to 1.5°C with no or limited overshoot. Under current policies and regulations, New Mexico is estimated to exceed cumulative emissions associated with a science-based pathway by 167 MMT CO_2e through 2030[5] — or about 21% more climate pollution than the state should emit during this timeframe if it were following a steadily declining trajectory designed to limit average temperature increase by 1.5°C.

States have a critical role to play in cutting greenhouse gas emissions across the country. A recent national emissions gap report[6] completed by EDF found that, if all states with climate commitments comparable to New Mexico's meet their reduction targets, the U.S. would close the remaining nationwide emissions gap by 43% in 2030. This would bring the U.S. significantly closer to achieve its climate commitments under the Paris Agreement. States like New Mexico, which is further off track than most other U.S. Climate Alliance states, have an even greater role to play in closing this gap than others.

We conclude by proposing policy opportunities that the state can enact to cut climate pollution in line with its commitments. The right policy solutions can not only secure critical emissions reductions and improve public health by reducing air pollution, but, by requiring pollution cuts that can only be achieved via a rapid transition to a clean energy economy, these policies can also help drive federal incentives newly available via the Inflation Reduction Act and related private-sector investment to the state, spurring economic development and creating new jobs. These policy opportunities begin with the administration taking steps to use its expansive existing authority to regulate GHG emissions across multiple sectors. Second, we recommend the Governor and legislators lean into comprehensive climate legislation that establish emissions targets that are mandatory, require reductions on a specific timeline, and prioritize early and sustained reductions toward full decarbonization. Third, we recommend that policymakers ensure any New Mexico climate policy prioritizes environmental justice and a just transition for the state's workers as they lead in establishing new laws to cut climate pollution. Finally, we encourage policymakers to increase capacity at state agencies to develop necessary climate regulations and enforcement while simultaneously securing and effectively deploying federal climate investments.

5 Cumulative emissions under Rhodium Group's central emissions scenario.

6 https://www.edf.org/report-turning-climate-commitments-results

INTRODUCTION

In her first days in office, Governor Michelle Lujan Grisham established a vision for New Mexico as a national climate leader. On January 29, 2019, Governor Lujan Grisham issued Executive Order 2019-003, outlining her plans for climate leadership in New Mexico, including joining the U.S. Climate Alliance, committing to supporting the Paris Agreement climate goals, establishing the state's Climate Change Task Force, and committing the state to a goal of reducing statewide emissions by 45% below 2005 levels by 2030, among other actions. In addition to that initial goal, US Climate Alliance States commit to reducing emissions by at least 26% to 28% by 2025 and 50% to 52% by 2030, both compared to 2005 levels, and to achieving net-zero emissions by 2050. Moreover, these goals are consistent with subsequent public commitments to achieve net-zero emissions by 2050 and support for legislation that would establish a 50% GHG emission reduction requirement by 2030, 75% GHG reduction requirement by 2040, and achieving net-zero emissions by 2050.

The U.S. Climate Alliance GHG reduction goals were designed to align with the pace and scale of ambition needed to avoid the worst impacts of climate change.[7] The urgency of the climate crisis continues to grow, and New Mexico has already begun experiencing those impacts in significant ways. It endured the largest wildfire in state history in 2022, a year when nearly three-fourths of the state experienced severe drought at some point. Furthermore, the 2025 and 2030 GHG reduction goals are consistent with the Biden Administration's Nationally Determined Contribution (NDC) under the Paris Climate Agreement of cutting GHGs to 50-52% below 2005 levels by 2030.

Months after issuing EO 2019-003, the Governor signed the Energy Transition Act into law, which establishes a renewable electricity standard requiring the state's investor-owned utilities to provide at least 50% renewable electricity by 2030 and 100% carbon-free electricity by 2045. In addition, over the subsequent three years New Mexico adopted two rules limiting methane pollution from the state's oil and gas industry, which contributes more than half of all GHG pollution statewide. The state also adopted Clean Cars New Mexico in October 2022 to require stricter limits on emissions from light-duty vehicles, and in July the Governor announced the state will adopt additional rules to curb emissions from medium- and heavy-duty vehicles (Advanced Clean Trucks) and further reduce emissions from light-duty vehicles (Advanced Clean Cars 2). However, several analyses conducted over the past several years — including the state's 2021 Climate Strategy Report and independent reports by Environmental Defense Fund and Evolved Energy Research — indicate that **the state is off-track to meet 2025 and 2030 GHG reduction commitments.**

To provide an updated view of where the state stands relative to its commitments in light of new state policies, significant federal climate investment via the Inflation Reduction Act, and a changing macroeconomic landscape, EDF conducted an analysis that focuses on the key metric for ensuring a safer climate future: reducing climate pollution at the pace and scale necessary to curb the worst impacts of climate change. This analysis includes evaluating progress and associated GHG emissions "gaps" toward 2025 and 2030 targets, as well as projected cumulative emissions between 2020 and 2030 associated with New Mexico's current trajectory through 2030. Rapid action to reduce emissions of short-lived gases (e.g., methane pollution) plays a central role in slowing and limiting near-term warming, while rapid action to reduce emissions of long-lived gases (e.g., carbon dioxide pollution) which can stay in the atmosphere for centuries, is crucial for limiting the overall amount of warming we will experience. Given the near-term impact of methane pollution and the cumulative build-up of carbon pollution, the path we take to achieving future emission reduction targets is at least as important as "hitting" a particular emissions level in a specific year.

Reducing GHG pollution is not only imperative to create a safer future climate, but also essential to protecting public health and addressing environmental injustice. The biggest sources of GHG emissions are also the biggest sources of local air pollution, like particulates, smog-forming contaminants, and air toxins.[8] This pollution is often most concentrated in communities of color and low-income communities because of polluting facilities that have been unjustly sited near them, historically as a result of

7 See Summary for Policymakers of IPCC Special Report on Global Warming of 1.5 °C. Available at: https://www.ipcc.ch/sr15/chapter/spm/.

8 Several of these pollutants also contribute to climate change by modifying Earth's energy balance.

discriminatory practices like redlining.[9] In January 2023, researchers released a report that finds GHG pollution is not regulated by state policy for many of New Mexico's largest polluters. These pollution sources are often located in low-income communities and communities of color, potentially leading to disproportionate impacts in those communities. Additionally, the report found that residents in counties with high concentrations of large stationary pollution sources have higher prevalence's of asthma and coronary heart disease compared to state averages.[10,11] In July 2023, New Mexico Voices for Children released a report highlighting the health impacts of climate change on children in New Mexico, finding that New Mexico's children are the most vulnerable to both physical and mental health impacts of climate change and associated extreme heat, drought, flooding, wildfire, air pollution, and other related impacts. The report finds, "if New Mexico does not take action to reduce the causes and effects of climate change now, more children will be at risk for severe health issues including asthma, chronic lung diseases, and heat released deaths, as well as worse mental health."[12] Cutting GHG emissions deeply, quickly and equitably — actions consistent with reducing cumulative GHG emissions via a steadily declining emissions trajectory — can improve health outcomes for New Mexicans who are harmed by both climate impacts and local air pollution, which we know disproportionately affect low-income communities and communities of color.

9 See Bell, M. L., & Ebisu, K. (2012). Environmental inequality in exposures to airborne particulate matter components in the United States. Environmental health perspectives, 120(12), 1699-1704. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3546368/. See also Tessum, C. W., Paolella, D. A., Chambliss, S. E., Apte, J. S., Hill, J. D., & Marshall, J. D. (2021). PM2. 5 polluters disproportionately and systemically affect people of color in the United States. Science Advances, 7(18), eabf4491. https://pubmed.ncbi.nlm.nih.gov/33910895/.

10 Disclosure: Environmental Defense Fund provided financial support to the researchers conducting this report.

11 Pacyniak, G., Ruiz, A., Sanchez-Youngman, S., & Krieger, E. (2023). Climate, Health, and Equity Implications of Large Facility Pollution Sources in New Mexico. Health, and Equity Implications of Large Facility Pollution Sources in New Mexico (February 1, 2023). See https://www.psehealthyenergy.org/our-work/publications/archive/largest-emission-sources/

12 Shiv, Divya, Addressing Climate Change to Improve Children's Health in New Mexico, p. 10. New Mexico Voices for Children.

FEDERAL INVESTMENT IN CLIMATE ACTION

Over the past two years, the federal government has made significant investments to lower the costs and incentivize increased deployment of clean energy technologies. These investments have come primarily via two major pieces of legislation: the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA).

The IIJA, which became law in 2021, appropriated hundreds of billions of dollars in infrastructure investment to accelerate deployment of clean energy and reduce climate pollution. New funding is provided for programs focused on public transit, zero-emission vehicles, energy efficiency, manufacturing, grid modernization and transmission, among many others.

The IRA, which became law in 2022, marks the most significant federal investment ever in climate mitigation by providing nearly $400 billion in funding for a wide range of GHG mitigation efforts and clean energy technologies. This includes substantial investment in a range of sector-specific opportunities including clean electricity via tax credits for technologies such as solar, wind, energy storage, energy efficiency, and geothermal; clean transportation, including via new consumer tax credits for zero-emission light-duty vehicles, funding for zero-emission trucks and buses including school and transit buses; industrial and manufacturing decarbonization to ensure more electric vehicles, wind and solar equipment, and lower-carbon heavy industrial materials are made in the U.S.; and nearly $21 billion to support climate-friendly agriculture. The IRA also includes funding set aside to enable investments in tribes and in low-income and rural communities and in communities transitioning away from fossil fuel-dependent economies; and investments to advance environmental justice, including $60 billion to address air pollution, improve energy efficiency in affordable housing, and expand air quality monitoring, among other programs. Finally, the IRA establishes the Methane Emission Reduction Program, which charges oil and gas polluters for wasting methane gas.

In addition to the range of direct federal investments in clean solutions outlined above, Congress also affirmed the critical role of further regulatory action in two ways. First, the historic modernization of the federal Clean Air Act reinforced and expanded the Environmental Protection Agency's authority to protect communities from climate and air pollution. Second, Congress underscored the importance of further state regulatory action, providing $5 billion for the Climate Pollution Reduction Grant (CPRG) program, created to provide states, cities and tribes resources to plan and implement regulatory policies to reduce GHG emissions. This funding can be a critical tool for states to develop enforceable regulations, the cost of which will be driven down by the clean energy incentives included in the IRA and IIJA. Under this program, New Mexico has been provided a $3 million planning grant and the City of Albuquerque has been provided a $1 million planning grant. New Mexico's tribes and pueblos are eligible to receive funding as part of a $25 million set-aside specifically for climate pollution reduction planning by tribes. Taken together, regulations and incentives like these can dramatically accelerate cuts to climate pollution and improve air quality, especially in communities who are disproportionately impacted by multiple sources of climate and air pollution.

Importantly, two-thirds of the estimated $400 billion in energy and climate funding (between 2022-2031) from the IRA comes in the form of tax credits.[13] These credits are uncapped, meaning the funding will scale with deployment, with states that are able to deploy more of the clean technologies supported by the IRA ultimately benefiting the most. In addition, around 40% of the total projected IRA funding comes specifically from tax credits for clean electricity. As discussed in more detail below, those clean electricity tax credits drive the majority of the IRA's reductions nationally; accelerated clean electricity deployment driven by the lower technology costs for zero-emission electricity generation accounts for 75% of the projected economy-wide GHG abatement from the IRA in 2030.[14]

13 Published estimates of the energy and climate funding from the IRA vary. Most are based on the scoring from the Congressional Budget Office (CBO) but some estimates are based on earlier CBO scoring (Energy Innovation - $369bn) or have categorized energy and climate funding differently (Rhodium Group - $383bn or Committee for a Responsible Federal Budget - $391bn).

14 https://rhg.com/research/climate-clean-energy-inflation-reduction-act/.

MODELING FEDERAL CLIMATE INVESTMENTS

Federal investments in the IRA are expected to significantly cut GHG pollution levels by dramatically lowering the cost of the transition to a clean energy future — creating an unprecedented opportunity for states to meet their commitments at a lower cost than ever before. However, there is a significant range in projected emission reductions both within and across different modeling efforts.[15] This variation between models is driven by several factors. **While all are economically optimized, the scope and detail of the models vary.** Some models, for instance, will account for constraints to transmission or model supply-chain and infrastructure constraints. In addition, as guidance on many of the IRA incentives is still being developed, different modeling groups have made different assumptions as to how the IRA will work in practice. Finally, there is also variation in some of the core assumptions that are inputs to these models. Different groups draw on different sources for technology cost assumptions or fossil fuel price projections.

The specific emission reduction contributions associated with IRA funding in New Mexico are beyond the scope of this analysis.[16] While the projected pollution cuts associated with the IRA and IIJA indicate that these policies are a key step toward meeting U.S. goals, it is important to underline the uncertainty around the pollution cuts that can be attributed to these laws. The projected emission reductions are the product of economic models which generally assume a high degree of responsiveness to economic incentives. This means they provide an indication of the emissions trajectories that would result from electricity systems that were maximally responsive to lowest-marginal cost electricity.

In practice, however, the sectors which account for the greatest potential emission reductions due to IRA incentives are subject to market frictions and constraints that will prevent these sectors from making cost-optimizing decisions predicted in economic models, absent additional policy intervention. Since the IRA and IIJA do not guarantee emissions outcomes consistent with the modeled impact, and the power sector is not structured in a way that ensures economically optimized behavior, these projections are potentially relatively optimistic — particularly given the outsized role of power sector abatement in the economy-wide projections.

Given the uncertainty of GHG emission reductions achieved via IRA and IIJA incentives, a key variable[17] in determining whether the U.S. succeeds in capturing the full abatement potential of the IRA is whether complementary state and federal regulatory policies are adopted to require cuts in climate pollution consistent with the U.S. NDC. Doing so would both increase deployment and investment in technologies incentivized by the IRA and IIJA at the scale necessary to reduce economy-wide pollution consistent with the U.S. NDC, and significantly increase the certainty of achieving those pollution cuts. In other words, states now have a crucial role to play in both realizing the promise of federal investments in the IRA and IIJA — locking in the projected reductions — and helping to close the remaining gap for the U.S. to achieve its climate goals.

15 Projected economy-wide emission reductions from 2005 levels by 2030, including with IRA investments, include: EPRI 32-33%, Princeton REPEAT 37-41%, Rhodium Group 32-42%.

16 Nationally, Rhodium Group's analysis projects that with the IRA in place, U.S. emissions could fall to 32%-42% below 2005 levels by 2030, compared to a 24%-35% reduction projected before the IRA was passed. EPRI's modeling finds that the IRA, combined with other policies and technology trends, has the potential to reduce U.S. economy-wide emissions 32%-33% below 2005 levels by 2030. The Princeton-led REPEAT Project estimates that U.S. emissions have the potential to fall 42% below 2005 levels by 2030, 15% lower than before the IRA was in place. Energy Innovation modeling estimates that with the IRA in place, the U.S. is projected to draw down emissions 37-41% below 2005 levels by 2030. The potential impacts of these investments are incorporated into this analysis through Rhodium Group's updated state-level emissions projections.

17 There are a range of other variables, including but not limited to ensuring that new clean electricity projects can connect to the electric grid in a timely fashion and that the electric grid has the transmission capacity necessary to deliver clean electricity from generation facilities to load centers.

EVALUATING PROGRESS TOWARD 2025 AND 2030 GHG TARGETS

EDF's updated analysis evaluates New Mexico's progress based on data from Rhodium Group's U.S. Climate Service comparing business-as-usual (BAU) gross[18,19] emissions projections[20,21] to two emissions benchmarks set by U.S. Climate Alliance states, 26% below 2005 levels by 2025 and 50% below 2005 levels by 2030, as well as New Mexico's goal of 45% below 2005 levels by 2030.[22] Emissions projections are based on data from Rhodium Group's U.S. Climate Service, using IPCC's 5th Assessment Report (AR5) 100-year global warming potential (GWP) in evaluating impacts of different gases on emissions in New Mexico.[23] Appendix 1 includes additional information on developing emissions targets and projections.

The analysis reveals that New Mexico is not on track to meet either its 2025 or 2030 emission reduction targets. EDF's analysis reveals that, by 2025, New Mexico is estimated to see a 1% increase in emissions to a 3% reduction in emissions below 2005 levels. By 2030, New Mexico is estimated to see a 9% to 16% reduction below 2005 levels.[24,25] In other words, New Mexico faces an emissions gap — the difference between projected emissions and those needed to fulfill the Governor's climate commitments — of between 20-23 MMT CO_2e to achieve at least a 26% reduction in 2025 and 26-36 MMT CO_2e to achieve at least a 50% reduction by 2030.

Figure 1 and Tables 1-2 below illustrate the gap between where the state's emissions are likely headed under current policy and where they need to be to meet targets. The range illustrates that, even under optimistic assumptions about how much state policies and regulations will deliver and if future economic conditions result in relatively low emissions, New Mexico's existing climate policies and

18 Gross emissions, in contrast to net emissions, do not account for emission sinks that remove carbon dioxide from the atmosphere (e.g., uptake of carbon dioxide and storage in forests and soils). EDF chose to evaluate gross emissions due to concerns related to data availability regarding New Mexico's emissions from the land-use, land-use change, and forestry (LULUCF) sector. While LULUCF is a common emissions sink, in New Mexico it has historically been an emissions source. The state's inventory estimated LULUCF (which it refers to as Natural and Working Lands) as contributing 4.8MMT CO_2e in 2005 and 6.1MMT CO_2e in 2018. Given this modest increase in emissions from LULUCF, we would expect inclusion of this sector to not significantly change our results. However, given uncertainty with data available via Rhodium, we opted to evaluate gross emissions.

19 We note that the U.S. NDC is evaluated in terms of net emissions. However, per the note above about LULUCF being an emissions source in New Mexico and lack of data for which we have a high degree of confidence, we have opted to evaluate these targets as gross emissions for the purpose of this analysis. We also note that New Mexico's 45% reduction target as set by EO 2019-003 does not specify whether that target is to be considered net or gross emissions. Finally, we note precedent for the 50% gross reduction target in the Governor's support for precisely this emissions target as included in HB6 during the 2022 legislative session.

20 BAU emissions reflect all New Mexico and federal policies in place as of June 2023.

21 To sum greenhouse gas emissions of different gas species (such as carbon dioxide and methane), a metric is required to compare the climate impacts of emissions. The standard metric used is carbon dioxide equivalence (CO_2e) with a 100-year time horizon (CO_2e100), which requires a Global Warming Potential multiplier for non-CO_2 gasses to represent the amount of CO_2 that would have the same climate impact (using radiative forcing as a proxy) over the following 100 years as the one-time amount of emissions of the non-CO_2 gas. We acknowledge that CO_2e is an imperfect metric, and that CO_2e represented on a 100-year time horizon, by itself, only conveys long-term climate impacts of emissions. Reporting greenhouse gas emissions using two time horizons, 20- and 100-year, to convey climate impacts over all timescales would be the better practice (Ocko et al. 2017). Given that the emissions data reported by Rhodium Group's U.S. Climate Service are presented in CO_2e using a 100- year GWP, we also conduct our analysis using this metric to be consistent with the data that is familiar to state-level decision makers. We use GWP values from IPCC AR5 to retain consistency with Rhodium and EPA but note that newer values are provided in IPCC AR6. We assess the implications of two time horizons and updated GWP values in 5, and note that updated GWP-100 values do not change the main conclusions of this report.

22 When citing emissions gaps in 2030 throughout this report, we compare the difference between projected emissions and levels associated with achieving a 50% reduction in GHGs. We include the 45% target in all figures, but via its participation in the U.S. Climate Alliance the state has committed to pursue at least a 50% reduction by 2030.

23 Note that Rhodium Group uses a downscaling methodology to estimate state-level emissions based on the EPA Greenhouse Gas Inventory. Because of this, state-level estimates do not align exactly with state GHG inventory estimates. For more information, see Appendix 4.

24 In providing an expected emissions level, we use Rhodium Group's central emissions scenario to represent a mid-range case for purposes of presenting illustrative statistics. However, we also present emissions as a range throughout this report to emphasize that future emissions trajectories are highly uncertain and depend heavily on macroeconomic factors and fuel and clean energy costs. For more information, see Appendix 1.

25 It is important to note differences in EDF's estimated 2005 baseline emissions in New Mexico and the 2005 emissions estimate included in the state's own inventory, the New Mexico Greenhouse Gas Emissions Inventory and Forecast, published in October 2020. For additional information on these differences in data used to estimate historical and current emissions between the New Mexico GHG Inventory and EDF and Rhodium's data can be found in Appendix 3.

regulations will still leave us short of the climate pollution cuts required by law. Actual emissions are expected to fall between the high and low estimates depicted in the figure, with the "central" emissions scenario projecting New Mexico to reduce emissions by less than half of what would be needed to achieve its 2025 and 2030 commitments.

Figure 1: New Mexico Economy-Wide Emissions Projections and Targets[26]

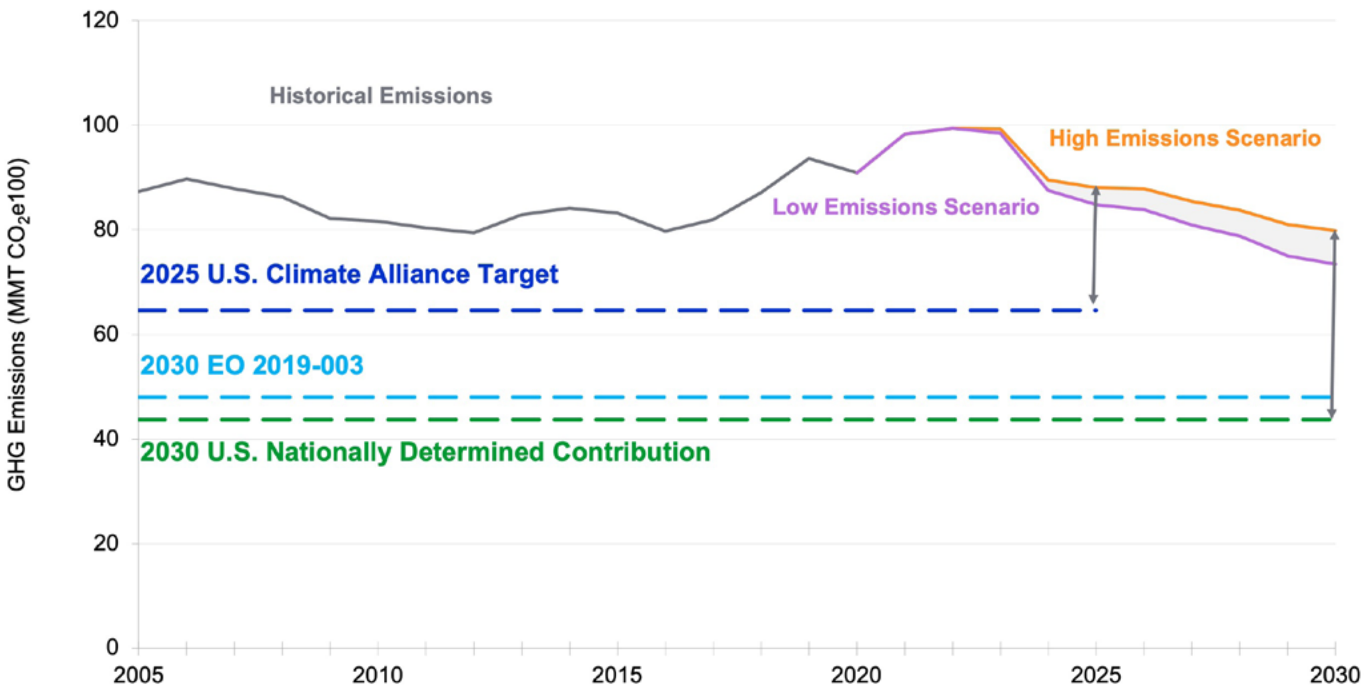


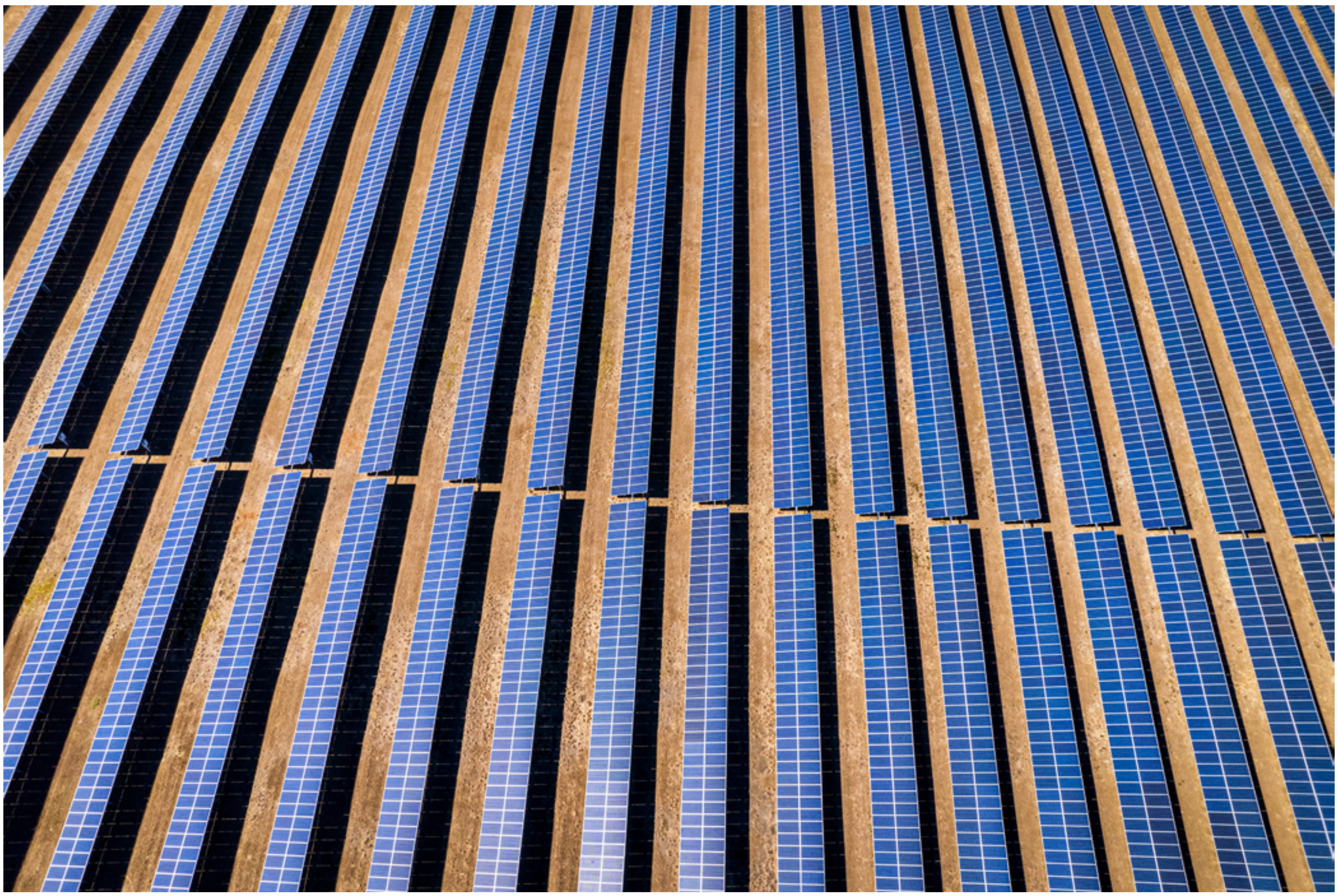
Table 1: New Mexico Economy-Wide Emissions Targets and Gaps

New Mexico					
	Target Year	Target	Target Emissions (MMT CO_2e)	Remaining Gap (High Emissions)	Remaining Gap (Low Emissions)
Contribution to National or USCA Targets	2025	26% below 2005	65	23	20
	2030	50% below 2005	44	36	26
State Targets	2030	45% below 2005 (EO 2019-003)	48	32	25

26 In Figure 1, the lower bound emissions estimate captures Rhodium Group's low emissions scenario while the upper bound emissions estimate captures Rhodium Group's high emissions scenario. These upper and lower bounds reflect a range of possible fuel prices, technology costs, and economic trends. See Appendix 1 for additional detail.

Table 2: New Mexico Economy-Wide Projected Emissions Reduction, in Percentages

New Mexico Projected Reduction from 2005			
Target Year	High Emission	Central Emissions	Low Emissions
2025	-1%	1%	3%
2030	9%	13%	16%



THE IMPORTANCE OF RAPID ACTION

In addition to evaluating progress on meeting emission reduction targets in 2025 and 2030, it is critical to assess the emissions pathway toward these milestone years. Rapid action to reduce GHG emissions has both near- and long-term benefits. For example, reducing emissions of short-lived climate pollutants (e.g., methane) — which largely govern the rate of warming — is crucial for slowing and limiting near-term warming and associated damages. Additionally, reducing emissions of long-lived climate pollutants (e.g., carbon dioxide) — which largely govern the maximum amount of warming — is crucial for limiting the overall amount of warming we will experience. This is because long-lived climate pollutants can last for centuries in the atmosphere, thus committing us to warming for generations to come. Therefore, rapid action is critical both to curb the near-term warming impacts of short-lived GHGs and to limit cumulative damages from long-lived GHGs that accumulate in the atmosphere and continue to warm the climate for hundreds of years.

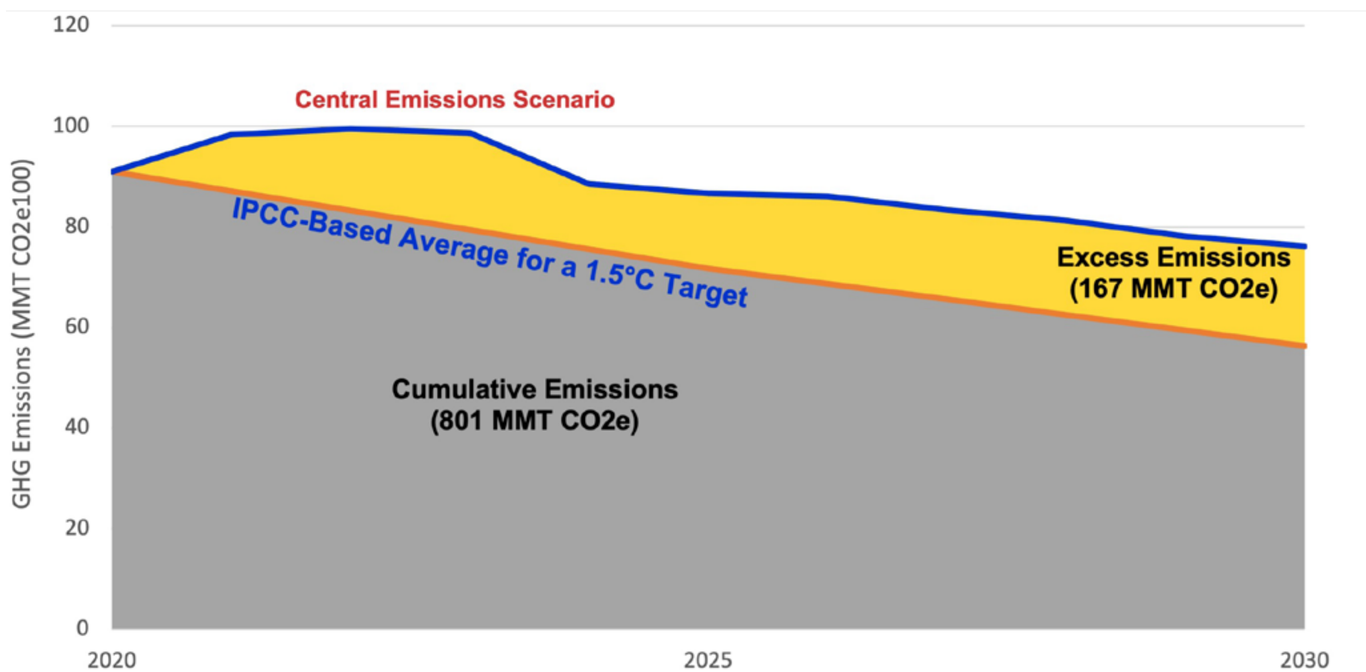
New Mexico, as a member of the U.S. Climate Alliance, has committed to taking actions necessary to help limit global average temperature rise to 1.5°C. To evaluate progress on this commitment, EDF analyzed the projected emissions pathway toward milestone years and the cumulative quantity of climate pollution that New Mexico. While annual emissions of short-lived climate pollutants generally dictate their climate impact, for long-lived climate pollutants (such as CO_2), the cumulative amount of emissions over time is a more important determinant of warming than the amount emitted in any single year. Therefore, we must ensure that total reductions in CO_2 over time align with assessments of carbon budgets that estimate the cumulative amount of CO_2 that can be emitted while staying below a particular temperature target.[27] To do so, we compare New Mexico's cumulative GHG emissions between 2020 and 2030 to levels consistent with a declining, linear emissions trajectory based on the average of pathways assessed by the IPCC to limit warming to 1.5°C.

27 IPCC Special Report on Global Warming of 1.5 °C. Available at https://www.ipcc.ch/sr15/chapter/chapter-2/

NEW MEXICO CUMULATIVE EMISSIONS THROUGH 2030

Our cumulative emissions analysis indicate that New Mexico is projected to overshoot its cumulative emissions budget by 167 MMT CO_2e, or 21% more emissions than the IPCC-consistent pathway.[28] Figure 2 shows New Mexico's projected cumulative emissions over the decade, with the area beneath the IPCC-based average 1.5°C target pathway representing the cumulative quantity of emissions under the target trajectory and the area between the target trajectory and the BAU GHG emissions indicating the cumulative quantity of excess emissions that are projected to occur (under the central emissions scenario).

Figure 2: Projected Cumulative Emissions Trajectories in New Mexico, 2020-2030[29]



NOTE: IPCC-based target trajectory is calculated as a 24% reduction by 2025 and 43% reduction by 2030, below 2020 net emissions. Emissions and target levels are presented in gross emissions (excluding carbon dioxide removal). In order to present the target trajectory in terms of gross emissions, we first calculate the target percent reduction from New Mexico's base year net emissions (e.g., 24% reduction from 2020 net emissions by 2025). Then, we add projected carbon dioxide removals for 2020-2030.

28 This number represents the overshoot in Rhodium Group's central emissions scenario. Under a high emissions scenario, we estimate overshoot of 260 MMT CO_2e between 2020 and 2030, while under the low emissions scenario we estimate 142 MMT CO_2e between 2020 and 2030.

29 IPCC's most recent assessment of modeled 1.5°C mitigation pathways has a steeper emissions decline up to 2025 than out to 2030, indicating the importance and urgency of rapid, large-scale reductions. For New Mexico, a similar 1.5°C consistent pathway allows for lower cumulative emissions than a pathway that meets the state's 2025 and 2030 target levels on a linear trajectory.

RECOMMENDATIONS TO CLOSE THE GAP

This gap analysis reveals that on its current path, even after accounting for historical recent federal climate investments, New Mexico is set to fall significantly short of meeting its climate goals in 2025 and 2030, and its cumulative emissions through 2030 significantly exceed an amount aligned with a 1.5°C pathway. Our central emissions scenarios indicate **New Mexico's emissions are set to be essentially flat over the 20-year period from 2005 to 2025**, and to decline just 13% percent by 2030 — well short of one third of the total reductions that the state has committed to by that date. With the 2025 goal two years away and time running out for course correction, the time to act is now. That will require use of all available tools, including use of existing authority under the Air Quality Control Act and other state law to cut pollution rapidly, across all sectors of the economy, followed by establishing firm, enforceable pollution limits through new legislation. **Paired with historic federal investments that will drive down costs and accelerate the deployment of clean technologies, New Mexico leaders have an unprecedented opportunity to act comprehensively in tackling greenhouse gas pollution — unlocking greater climate ambition at a lower cost.**

EDF recommends New Mexico move forward with these key steps to get back on track to meet its climate commitments.

Priority Action Item #1: Act now using existing authority to regulate greenhouse gas emissions to reduce pollution. The New Mexico Environment Department has broad authority to regulate pollutants under the Air Quality Control Act. Examples of the administration's use of this authority include air quality rules governing oil and gas operations adopted in 2022, and recently petitioned Advanced Clean Trucks and Advanced Clean Cars Two rules. However, the agency can go significantly further to limit climate pollution. And with federal investments included in the IRA making a wide range of clean technology deployments in New Mexico dramatically cheaper, the state can leverage these investments to cut pollution across key sectors.

While many options for use of this existing authority in the near future include the following, including finalizing strong new Advanced Clean Cars and Advanced Clean Trucks rules, several key additional recommendations include:

- A firm, enforceable limit on all statewide pollution, or absent doing so for all statewide pollution, targeting facility-specific pollution limits for the state's largest stationary emissions sources;[30] and
- Expedite the adoption of a state plan to implement the forthcoming final EPA methane rules including strengthening existing regulations to achieve the state's emission reduction targets and reduce GHG pollution from oil and gas exploration, production, processing, transmission, and storage, that go above and beyond federal requirements.

Priority Action Item #2: Set mandatory GHG emission reduction targets, prioritizing early and deep reductions and setting a declining path between current pollution levels and deeper decarbonization. Comprehensive climate change legislation is foundational to state-level climate leadership. It is critical that states like New Mexico establish mandatory, science-based emission reduction targets to guide regulatory action in pursuit of reducing pollution to safer levels. Moreover, setting mandatory targets via legislation is critical to ensure climate progress now and into the future beyond Governor Lujan Grisham's term in office.

Critically, these targets should include mandatory reductions and establish a timeline for establishing regulations to cut pollution that achieve early and deep reductions. To date, 11 states have established binding, economy-wide climate targets.[31] All of these have either been adopted or significantly enhanced since 2019, and nearly all include economy-wide targets consistent with the U.S. NDC. Scientific assessments indicate that rapid action to curb climate pollution is needed to avert the worst impacts of climate change. As described in detail in earlier sections, reductions in short-lived pollutants (e.g., methane pollution) are crucial to slow and limit the rate of warming, while early reductions in long-lived pollutants (e.g., carbon pollution) are crucial to limit the cumulative climate pollution in the atmosphere and the associated amount of warming. A focus on near-term targets is also essential because delayed action will make it increasingly difficult for

30 Pacyniak et al., 2023.

31 In addition to the ten identified in the fact sheet included, Delaware added binding, economy-wide targets when the Delaware Climate Change Solutions Act of 2023 was signed on August 3, 2023.

states to meet longer-term reduction targets, such as achieving net-zero emissions by mid-century.

Additionally, comprehensive climate legislation must include a clear directive to state regulators to establish new rules capable of driving pollution cuts at the pace and scale needed to fully close the state's emissions gap; policies requiring that pollution reductions be prioritized in disproportionately impacted communities; and dedicated resources and other investment to support a just transition in the state, particularly for communities who heavily rely on a fossil fuel economy.

Priority Action Item #3: Establish a clear vision and resources to support a just transition for the state's workers and communities. Any climate bill must include assurances that disproportionately impacted communities stand to benefit from the transition to a clean energy economy — including requirements that pollution reductions and investments are prioritized in those communities. This focus is aligned with the Biden Administration's Justice40 principles. The state could start to develop a vision for just economic transition through creation and funding of an Economic Transition Division, as proposed in HB188 during the 2023 legislative session.

Priority Action Item #4: Increase capacity at relevant state agencies — most notably the New Mexico Environment Department and the Energy, Minerals, and Natural Resources Department — to support a robust regulatory program designed to cut GHG pollution at the pace and scale necessary to achieve the state's targets. Additional resources will be necessary as the state pursues more ambitious regulatory programs to address climate change. For example, New Mexico must dedicate sufficient funds to adequately staff and resource the enforcement of recently adopted rules to limit methane pollution from oil and gas emitters, ensuring reductions occur at the scale needed.

Priority Action Item #5: Maximize federal and state investment in climate solutions. The IIJA and IRA create enormous opportunity to reduce the cost of the transition to lower-carbon technologies and support a safer, prosperous clean energy future. We believe the most effective way to maximize these investments is to pursue each of the four abovementioned priority action items, in particular those that require pollution cuts and will thereby push private-sector actors — for example, electric and gas utilities, large building owners, and others — to invest in clean energy technology and simultaneously secure federal incentives to buy down the cost of those investments. In addition, New Mexico should best position itself for funding under the Environmental Protection Agency's Climate Pollution Reduction Grant (CPRG) program, namely implementation grants, by developing a regulatory strategy capable of delivering on specific actions targeting emission reductions that align with the U.S. NDC and emissions pathways that constrain cumulative emissions to those aligned with limiting global average temperature increases to 1.5°C with limited or no overshoot.[32]

32 See Summary for Policymakers of the Working Group III contribution to IPCC Sixth Assessment Report, available at: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf.

APPENDIX 1: PROJECTED EMISSIONS AND UNCERTAINTIES

EDF's analysis uses historic and projected emissions data from Rhodium Group's U.S. Climate Service modeling, released in August 2022.[33] The emissions projections incorporate projected abatement from policies in place as of June 2022[34] as well as projected abatement driven by the IRA and IIJA. In addition, EDF made adjustments to Rhodium Group's oil and gas methane estimates and adjusted state emissions projections to reflect the projected impact of additional significant policies finalized by March 2023.[35]

Rhodium Group employs a downscaling methodology to estimate state-level emissions based on the EPA Greenhouse Gas Inventory using relevant metrics like state-level fuel consumption. In part as a result of this downscaling methodology, state-level emissions estimates do not align exactly with state GHG inventory estimates.[36] This methodology results in some uncertainty around state-level emissions estimates, especially for land-based carbon dioxide sinks. Rhodium Group's emissions data is reported in carbon dioxide-equivalent based on the IPCC 5th Assessment Report (AR5) 100-year global warming potential values.[37]

In this report, we present a range of emissions projections based on different scenarios provided in Rhodium Group's U.S. Climate Service data:

- **The High Emissions scenario** is based on data from Rhodium Group's high emissions scenario. This scenario represents a likely upper bound for potential emissions trajectories. Actual emissions under business-as-usual are likely to be below this estimate.
- **The Low Emissions scenario** is based on data from Rhodium Group's low emissions scenario. This scenario provides a likely lower bound for potential emissions trajectories. Actual emissions under business-as-usual are likely to be above this estimate.
- **The Central Emissions scenario** is based on data from Rhodium Group's central emissions scenario. Rhodium Group constructs the high and low emissions scenarios to show bounds of uncertainty around the central case over the costs of fossil fuels and clean technologies, as well as macroeconomic trends.

Rhodium Group produces different emissions trajectories to account for the uncertainty in future technology and fuel costs as well as macroeconomic trends. Actual emissions are expected to fall between the high and low estimates. When referring to emissions projections as a single number, we are reporting emissions under the central emissions scenario. Otherwise, we cite an emissions range throughout this report to emphasize that future emissions trajectories are highly uncertain and depend heavily on the pace of economic growth and the future costs of technologies and fuels. Specifically, Rhodium Group evaluates three major sources of uncertainty:

- **Energy Markets:** Rhodium Group considers a range of energy market variables that shape emissions outcomes, including natural gas and oil resource availability and prices.
- **Technology Cost and Performance:** Rhodium Group estimates ranges for key technology cost and performance variables, including capital and operating costs for clean electricity generators and battery costs for light-duty electric vehicles.

33 https://rhg.com/research/climate-clean-energy-inflation-reduction-act/.

34 For more information, see Rhodium Group's 2022 Taking Stock report, available at: https://rhg.com/wp-content/uploads/2022/07/Taking-Stock-2022_US-Emissions-Outlook.pdf.

35 EDF's adjustments to Rhodium Group's data are described in more detail in Appendix 2.

36 For more information about Rhodium Group's U.S. Climate Service data methodology, see https://rhg.com/wp-content/uploads/2022/07/Taking-Stock-2022_US-Emissions-Outlook.pdf.

37 Note that the IPCC has updated GWP values in its Sixth Assessment Report (AR6), and that a 100-year time horizon is biased towards long-term climate impacts. However, in order for our analysis to be consistent with and comparable to the Rhodium and EPA data familiar to state-level decision makers, we also employ GWP-100 values from IPCC AR5 in this report and note that this does not reflect the latest science nor account for methane's large near-term impacts. However, the use of IPCC AR5 GWPs and a 100-year time horizon does not change the conclusions, because the targets would also need to be recalculated with different GWP values and/or 20-year time horizons.

- **Economic:** Rhodium Group's emissions range is bounded by a high and a low economic growth scenario.

For more details on these scenarios, as well as Rhodium Group's methodology for developing the emissions projections that are referenced throughout this report, see Rhodium Group's Taking Stock 2022 report and the accompanying Technical Appendix,[38] as well as Rhodium Group's updated report evaluating the potential impacts of the IRA.[39]

Rhodium Group also provides a high and low estimate for carbon dioxide removals in the Land Use, Land Use Change, and Forestry (LULUCF) sector. In this analysis, the high emissions scenario uses the low sequestration estimate for LULUCF and the low emissions scenario uses the high sequestration estimate for LULUCF; the central emissions scenario uses the average between the low and high sequestration estimates.

38 https://rhg.com/research/taking-stock-2022/.

39 https://rhg.com/research/climate-clean-energy-inflation-reduction-act/.

APPENDIX 2: ADJUSTMENTS TO RHODIUM GROUP U.S. CLIMATE SERVICE DATA

In general, this report uses historical and projected emissions data from Rhodium Group's U.S. Climate Service data to estimate baseline emissions (i.e., historical emissions and business-as-usual projections).

EDF replaced Rhodium Group's methane estimates for oil and natural gas systems based on a separate EDF analysis using site-level measurements and peer-reviewed methods. Specifically, EDF estimated current upstream methane emissions from the oil and gas sector using a combination of EPA Greenhouse Gas Reporting Program and Alvarez et al. 2018 data.[40] Downstream methane emissions from the oil and gas sector are estimated using Greenhouse Gas Inventory data, disaggregated to the state level and adjusted to account for underestimations using Zimmerle et al.[41] and Weller et al.[42] Historical methane emissions were back-projected using production data from Enverus. Future methane emissions were projected based on proprietary production data from Rystad Energy. To incorporate this analysis, EDF replaced Rhodium Group's central emissions projections for oil and gas methane and scaled the low and high emissions projections in proportion to EDF's modeling.

40 Alvarez, R. A., Zavala-Araiza, D., Lyon, D. R., Allen, D. T., Barkley, Z. R., Brandt, A. R., ... & Hamburg, S. P. (2018). Assessment of methane emissions from the US oil and gas supply chain. Science, 361(6398), 186-188. https://www.science.org/doi/full/10.1126/science.aar7204.

41 Zimmerle, D. J., Williams, L. L., Vaughn, T. L., Quinn, C., Subramanian, R., Duggan, G. P., ... & Robinson, A. L. (2015). Methane emissions from the natural gas transmission and storage system in the United States. Environmental science & technology, 49(15), 9374-9383. https://pubs.acs.org/doi/abs/10.1021/acs.est.5b01669.

42 Weller, Z. D., Hamburg, S. P., & von Fischer, J. C. (2020). A national estimate of methane leakage from pipeline mains in natural gas local distribution systems. Environmental science & technology, 54(14), 8958-8967. https://pubs.acs.org/doi/abs/10.1021/acs.est.0c00437.

APPENDIX 3: DIFFERENCES IN HISTORICAL EMISSIONS FROM NEW MEXICO GHG EMISSIONS INVENTORY

Historical emissions cited in this report differ from the state's own New Mexico Greenhouse Gas Emissions Inventory and Forecast, conducted by Energy and Environmental Economics, Inc. (E3). In total, EDF's estimated baseline emissions in 2005 are 22.5 MMT CO_2e, or nearly 30%, greater than E3 estimates for the state's inventory — EDF's estimate in 2005 is that the state emitted 98.1 MMT CO_2e, while the state inventory estimates total emissions of 75.6 MMT CO_2e. By 2018, EDF estimates economy-wide emissions to have declined modestly to 91.0 MMT CO_2e, while the state inventory estimates 2018 emissions to have risen by more than 50% to 113.6 MMT CO_2e.[43] Rhodium Group employs a downscaling methodology to estimate state-level emissions based on the EPA Greenhouse Gas Inventory using relevant metrics like state-level fuel consumption. This methodology results in some uncertainty around state-level emissions estimates, especially for land-based carbon dioxide sinks. Rhodium Group's emissions data is reported in carbon dioxide-equivalent based on the IPCC 5th Assessment Report (AR5) 100-year global warming potential values. In addition to small differences associated with discrepancies between E3's and Rhodium Group's methodologies to estimate emissions, our analysis also differs based on how we treat electricity sector emissions, EDF's substitution of our own fugitive oil and gas methane emissions in place of Rhodium Group's, and differences in emissions from "carbon removals," in particular land-use, land-use change, and forestry. These are discussed in detail below.

Electricity Generation. In calculating GHG emissions from the electricity sector, EDF chose to evaluate emissions associated with all in-state electricity consumption. Conversely, in the state GHG inventory E3 calculates emissions from all in-state electricity generation, stating "[h] igh quality historical data on dispatch of in-state and out-of-state plants for New Mexico electricity use requires additional research beyond the scope of this study. Therefore, this analysis is based on in-state generation."[44]

The state inventory excludes any emissions from the Four Corners Generating Station, which is located within New Mexico on the Navajo Nation, on the grounds that the plant "does not fall under state authority and most of the power from the plant is not consumed in New Mexico."[45] EDF chose to use estimated emissions from retail electricity sales rather than in-state generation for the following key reasons:

- Regulating emissions from retail electricity used in-state is the most effective way to ensure cutting emissions from the sector. Focusing strictly on emissions from in-state generation risks significant emissions leakage in response to policies intended to target GHG reductions from within a state's boundaries.
- The ability of states to regulate emissions associated with out-of-state electricity generation is well-established. States like California, Colorado, Washington, and New York are already doing so or in the process of developing regulations to do so, and there are several legal mechanisms to do so.
- Where E3 determined emissions from retail electricity was beyond the scope of the research conducted to complete the state's inventory, EDF is sufficiently confident in Rhodium Group's estimates of emissions associated with in-state electricity consumption to use it in this analysis.

The actual impact on historical emissions of the decision to include emissions associated with in-state retail sales, including in the state's 2005 emissions baseline, as compared to the state's methodology of including emissions from in-state generating units excluding Four Corners, is rather small. This is acknowledged in the state's own inventory: "Note that since 2005, retail sales of electricity in New Mexico have not varied more than 6% above or below generation from in-state units; thus, taking a simplified approach of relying on high quality historical data of in-state

43 Note that EDF's emissions projections estimate that the state's emissions will have peaked in 2022, at 100 MMT CO_2e.

44 "New Mexico Greenhouse Gas Emissions Inventory and Forecast" p. 19

45 Ibid, p. 19

emissions is a reasonable proxy for emissions attributable to the New Mexico electricity sector."[46] Under Rhodium Group's central emissions scenario, emissions from electricity consumed in the state are estimated to have been 14.53 MMT CO_2e in 2005. This equates to 1.77 MMT CO_2e fewer emissions than from in-state generating units using EIA data presented in the state's own inventory. In other words, the resulting difference when comparing the state's projected emissions to a 2030 target is less than one million metric tons of CO_2e, or about 1% of the state's baseline. Looking ahead to 2018 numbers, the state's inventory indicates in-state electricity generation accounted for 12.1 MMT CO_2e, as compared to our estimate of 10.47 MMT CO_2e under the central emissions scenario.

Oil and Gas Emissions. EDF's methodology for estimating fugitive methane emissions from the oil and gas sector is described in detail in Appendix 2 (above). In 2005, estimated fugitive methane emissions from oil and gas are significantly higher under EDF's estimates in the state inventory. EDF estimates fugitive methane emissions equated to 25.9MMT CO_2e in 2005, whereas E3 estimates were 9.3MMT CO_2e in the same year (a 16.6MMT CO_2e difference). By 2018, EDF's estimate had risen to 31.6 MMT CO_2e from oil and gas methane, which closely approximates the state's own estimate of 32.7 MMT CO_2e.[47]

There are also significant discrepancies between the state's estimates of fuel combustion emissions associated with oil and gas and those provided by Rhodium Group.[48] RHG's analysis combines these emissions and other industrial emissions into a single category, so it is impossible to compare directly. However, industrial emissions (including from fuel combustion for oil and gas) are estimated to be 14.2 MMT CO_2e in 2005, fairly close to the state's own estimate of 12.1 MMT CO_2e in 2005. However, by 2018 RHG estimates these emissions declined to 11.9 MMT CO_2e, significantly less than E3's estimate of 29.8 MMT CO_2e from the same group of sources.

Carbon Removals. While many states experience negative emissions associated with these sources, LULUCF has historically been a source of emissions in New Mexico. The state's inventory estimated total LULUCF emissions (referred to as Natural and Working Lands in the inventory) to be 4.8 MMT CO_2e in 2005 and 6.1 MMT CO_2e in 2018. The state's 2030 projections maintain that 6.1 MMT CO_2e estimate of BAU emissions in 2030. By contract, Rhodium's 2023 estimates are significantly higher in 2005 — 10.8 MMT CO_2e from LULUCF — but drop off considerably starting in 2016, ending at just 1.5 MMT CO_2e in 2030. This significant drop-off, inconsistent with the state's own estimates and without clear explanation, led us to exclude LULUCF emissions entirely from our analysis.

In aggregate, the differences in estimated historical emissions suggest EDF's estimates of the state's current and projected future emissions, and its emissions gaps, are conservative. This is primarily because EDF's estimates of baseline emissions in 2005 are higher, making the 2025 and 2030 targets also higher. Current and projected future emissions may also be on the conservative side, depending on whether Rhodium's substantially lower estimates of combustion emissions from the oil and gas sector or E3's estimates of significantly higher emissions from these sources is reflective of actual present-day and likely future emissions.

46 Ibid, p. 19

47 We note that EDF's estimates of fugitive methane emissions from oil and gas in New Mexico peak in 2023, at 45.5 MMT CO_2e.

48 EDF only substituted estimates for fugitive methane emissions from oil and gas but does not have data on combustion emissions from the sector. Therefore, we rely on Rhodium Group's estimates of these emissions.

APPENDIX 4: COMPARISON TO ANALYSIS IN EDF NATIONAL GAP REPORT

In July 2023, EDF released "Turning Climate Commitments into Results: An Update on State-level Climate Targets."[49] In that report, EDF presented data showing that states — like New Mexico — who have made commitments to reduce emissions in line with the U.S. NDC were on collectively on track to reduce emissions 20% to 23% by 2025 and 27% to 39% by 2030, both compared to 2005 levels. EDF also presented state-level analysis in that report, including for New Mexico. There are several key differences between the estimates that we presented in that report and this one.

First, Rhodium Group data used in that national analysis used Rhodium's U.S. Climate Service modeling data released in August 2022, which incorporates projected emissions from policies in place as of June 2022 as well as those driven by the Inflation Reduction Act. EDF adjusted that data to include reductions associated with any significant state-level policies as of March 2023, though this did not include adjustments in New Mexico. The New Mexico-specific report uses recently released data from Rhodium's U.S. Climate Service that incorporates all state and federal policies as of June 2023, as well as updated estimates of any impacts energy markets, technological cost and performance, and macroeconomic trends may have on emissions through 2035 (see Appendix 1 for additional detail). Rhodium also updated their methodology when accounting for different global warming potentials of different gases, from those values used in the IPCC's 4th Assessment Report (AR4) 100-year global warming potential (GWP) values to those same GWP values taken from the IPCC's 5th Assessment Report (AR5). For more information, see Appendix 5.

Second, EDF used different methodology for developing emissions targets in the national gap report. There are multiple methods for downscaling the U.S. Climate Alliance commitments — reducing collective net GHG emissions by 26 to 28% by 2025 and 50 to 52% by 2030 — to emission target levels for individual Alliance members, as we did in the national gap report. In that analysis, the 2025 U.S. Climate Alliance target was represented as a 26% reduction from 2005 gross emissions by 2025, as it is in this report. We determined, given the timeline for action, that it was reasonable to focus on gross emissions as nearly all achievable reductions over the next two years will be reductions in gross emissions.[50] In the New Mexico-specific analysis, we treat all targets as gross emissions. To provide a benchmark for the 2030 target in the national report, we estimated the level of gross[51] emission reductions climate leadership states to collectively achieve a 50% reduction in net emissions by 2030.[52] However, we then converted this net emissions target to gross emissions for the purposes of presenting the 2030 target in terms of gross emissions. To do so, we calculated the target percent reduction from the base year's net emissions (e.g., 50% reduction from 2005 net emissions by 2030). Then, the projected carbon dioxide removals for the target year, as provided by Rhodium Group's U.S. Climate Service, were added to the net emissions target.[53] This provides the gross emissions level needed to achieve the net emissions target in the target year for a given state. Given projected carbon removals in 2030 under the central emissions scenario, climate leadership states were estimated to need to collectively reduce gross emissions by 45% by 2030 in order to achieve the 50% net emission reduction target. We thus applied a 45% gross emission reduction to each state in order to measure state-level progress on reducing emissions consistent with state 2030 commitments.

Third, in this analysis EDF uses different estimates of electricity sector emissions than were used in the report released in July 2023. In part because the primary focus of that analysis is on aggregate emissions estimates across all

49 https://www.edf.org/report-turning-climate-commitments-results

50 Deploying carbon removal technologies at scale will take sustained investment and innovation. Nearly all reductions in the next five years are expected to come from reducing emissions at the source.

51 Excluding the impact of carbon removals and LULUCF.

52 This aligns with Climate Action Tracker's methodology for evaluating progress on NDCs. For example, Climate Action Tracker estimates the U.S. NDC of a 50 to 52% net emission reduction below 2005 levels by 2030 is equivalent to a 44 to 47% gross emission reduction, when excluding the impact of emissions and sinks from LULUCF. See https://climateactiontracker.org/countries/usa/targets/.

53 When converting net emissions targets into gross emissions target levels in the national report, we used the central emissions projection for carbon removals in the target year. The central estimate is the average between Rhodium Group's high and low sequestration estimates for the LULUCF sector.

climate leadership states, EDF estimated electricity sector emissions associated with in-state electricity generation. For New Mexico, this included emissions associated with the Four Corners Generating Station. (For a detailed discussion of how we treat these emissions in this report, see Appendix 3.) The result is a significantly higher 2005 baseline in the national report released in July than in this report, which leads to higher target emissions levels in 2025 and 2030.

Finally, EDF includes all LULUCF emissions in this analysis. Because Rhodium Group estimates that these emissions have declined significantly since the 2005 baseline year, the effect of including these is to increase the estimated statewide emissions reductions and close the gap between emissions targets and projected emissions, as compared to the national report.

Figure 3: Economy-Wide GHG Emissions and Targets – July 2023 National Gap Report

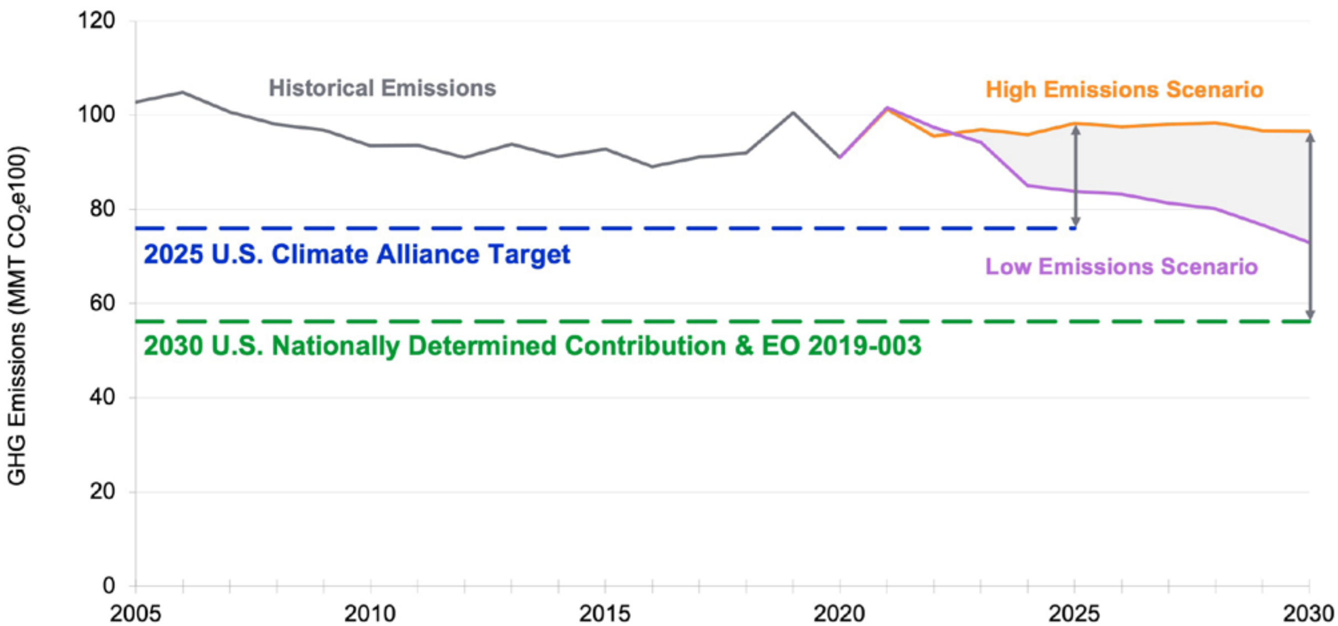


Table 3: Emissions Gaps in New Mexico, 2025 - 2030 – July 2023 National Gap Report

New Mexico					
	Target Year	Target	Target Emissions (MMT CO_2e)	Remaining Gap (High Emissions)	Remaining Gap (Low Emissions)
Contribution to National or USCA Targets	2025	26% below 2005	76	22	8
	2030	50% below 2005	56	40	17
State Targets	2030	45% below 2005 (EO 2019-003)	57	40	16

APPENDIX 5: COMPARING GWP VALUES

Historical and projected emissions presented in this report are based on data from Rhodium Group's U.S. Climate Service, which as of release of their 2023 data reports emissions in carbon dioxide-equivalent based on the IPCC 5th Assessment Report (AR5) 100-year global warming potential (GWP) values. [54, 55] This is consistent with the methodology used in EPA's Inventory of Greenhouse Gas Emissions and Sinks.[56]

The IPCC has updated GWP values in its Sixth Assessment Report (AR6), and therefore AR5 GWP values do not reflect the most up-to-date scientific research. Additionally, the 100-year GWP masks the near-term warming impact of methane,[57] which is over 80 times more potent than carbon dioxide on a 20-year timescale in terms of its warming effect on the atmosphere according to AR6. Given that warming over all timescales matters, EDF recommends separately reporting emissions by different gas species whenever possible, and reporting carbon dioxide-equivalent emissions using both 20-year and 100-year time horizons, as this more adequately captures climate impacts in both the near- and long-term than using GWP-100 alone.[58]

However, in order to be consistent with the targets and data reported by Rhodium Group's U.S. Climate Service and EPA, we employ the AR5 GWP-100 values. We also note that updating the data presented in this report to reflect the latest science (both 20- and 100-year time horizons and AR6 values) would adjust both the targets and the emissions trajectories, and therefore would not alter the conclusions of this analysis: that climate leadership states face significant gaps to meeting their commitments.

In this appendix, we illustrate how updating the data to reflect the latest science would impact the results of our analysis. We analyze three different state-level emissions projections: one using 100-year AR5 GWP values, one using the 100-year AR6 GWP values, and one using 20-year AR6 GWP values.[59] We also include 100-year AR4 GWP values in the table below, for comparison between values that were used in EDF's recently-released national gap report and those used in this analysis. Table 4 below compares these different GWP values by gas.

54 For more information about Rhodium Group's U.S. Climate Service data methodology, see https://rhg.com/research/taking-stock-2023/

55 Rhodium Group updated their U.S. Climate Service data methodology ahead of release of the 2023 Taking Stock Report. Whereas in 2022 and years prior they used AR4 GWP values, Rhodium now uses AR5. Emissions numbers associated with those GWP values are included in this analysis, though in EDF's recently-released national gap report, we cited Rhodium data still using AR4 GWP values.

56 See https://www.epa.gov/system/files/documents/2023-04/US-GHG-Inventory-2023-Main-Text.pdf.

57 Ocko, IB, SP Hamburg, DJ Jacob, DW Keith, NO Keohane, M Oppenheimer, JD Roy-Mayhew, DP Schrag, SW Pacala, Unmask temporal trade-offs in climate policy debates, Science, 356, 6337, p.492-493 (2017).

58 Id.

59 Emissions were estimated on a CO_2-equivalent basis using AR6 GWP values for methane, nitrous oxide, and sulfur hexafluoride. HFC and PFC data are provided by Rhodium Group as total HFC and PFC emissions. HFC-134a and PFC-CF4 are the species of HFC and PFC, respectively, with the most emissions, so we use the GWP for HFC-134a and PFC-CF4 as proxies for all HFCs and PFCs in the absence of data for individual species.

Table 4: Summary of Relevant Global Warming Potential Values from IPCC AR4, AR5 and AR6 [60,61]

Global Warming Potential Values				
Greenhouse Gas	**AR4 100-year GWP**	**AR5 100-year GWP**	**AR6 100-year GWP**	**AR6 20-year GWP**
Carbon Dioxide (CO_2)	1	1	1	1
Methane (CH_4) (fossil methane)[62]	25	28	27 (30)	81 (83)
Nitrous Oxide (N_2O)	298	265	273	273
Nitrogen Trifluoride (NF_3)	17,200	16,100	17,400	13,400
HFC-134a[63]	1,430	1,300	1,530	4,140
PFC-CF4[64]	7,390	6,630	7,380	5,300
Sulfur Hexafluoride (SF_6)	22,800	23,500	25,200	18,300

60 Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: Changes in Atmospheric Constituents and in Radiative Forcing. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

61 Forster, P., T. Storelvmo, K. Armour, W. Collins, J.-L. Dufresne, D. Frame, D.J. Lunt, T. Mauritsen, M.D. Palmer, M. Watanabe, M. Wild, and H. Zhang, 2021: The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 923–1054, doi:10.1017/9781009157896.009.

62 Throughout this report, we use 100-year GWP values for fossil and non-fossil methane to estimate CO_2e emissions. We apply non-fossil methane GWP values to methane emissions in the agriculture and waste sector, as provided by Rhodium Group's U.S. Climate Service data. For all other methane emissions, including in the oil and gas, industry, and transport sectors, we apply fossil methane GWP values to estimate CO_2e emissions.

63 HFC data are provided by Rhodium Group as total HFC emissions. HFC-134a is the species of HFC with the most emissions so we use the GWP for HFC-134a as a proxy for all HFCs in the absence of data for individual species.

64 PFC data are provided by Rhodium Group as total PFC emissions. PFC-CF4 is the species of PFC with the most emissions so we use the GWP for PFC-CF4 as a proxy for all PFCs in the absence of data for individual species.

Figure 4 shows GHG emissions for New Mexico using the 100-year AR5 GWP values to estimate emissions on a carbon dioxide-equivalent basis. This reflects the approach used to estimate emissions throughout this report.

Figure 4: New Mexico Economy-Wide GHG Emissions and Targets Using AR5 100-year GWP

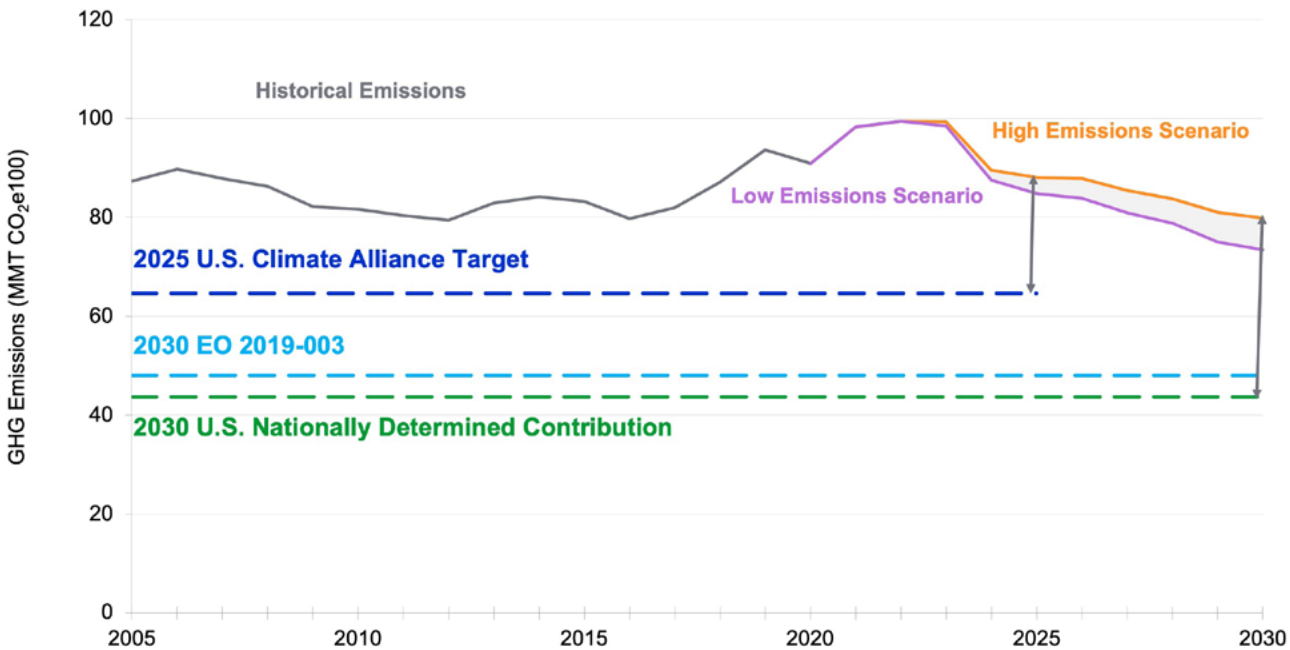
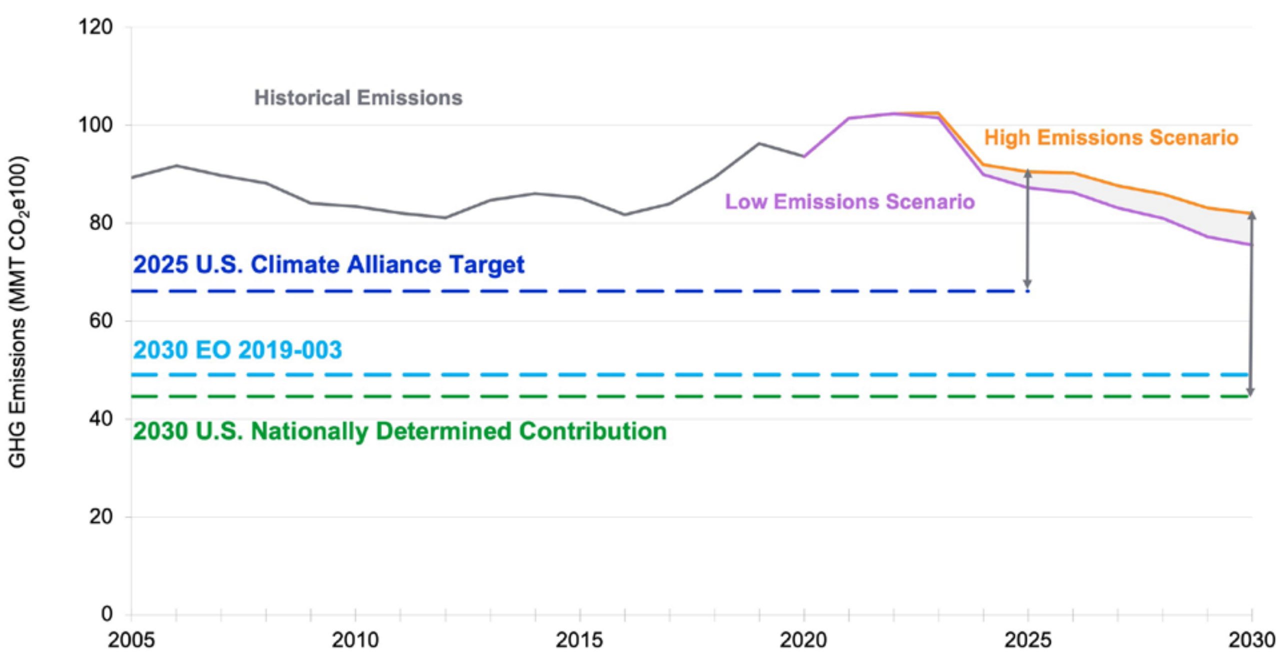


Figure 5 below shows GHG emissions for New Mexico using the AR6 100-year GWP values to estimate emissions on a carbon dioxide-equivalent basis.

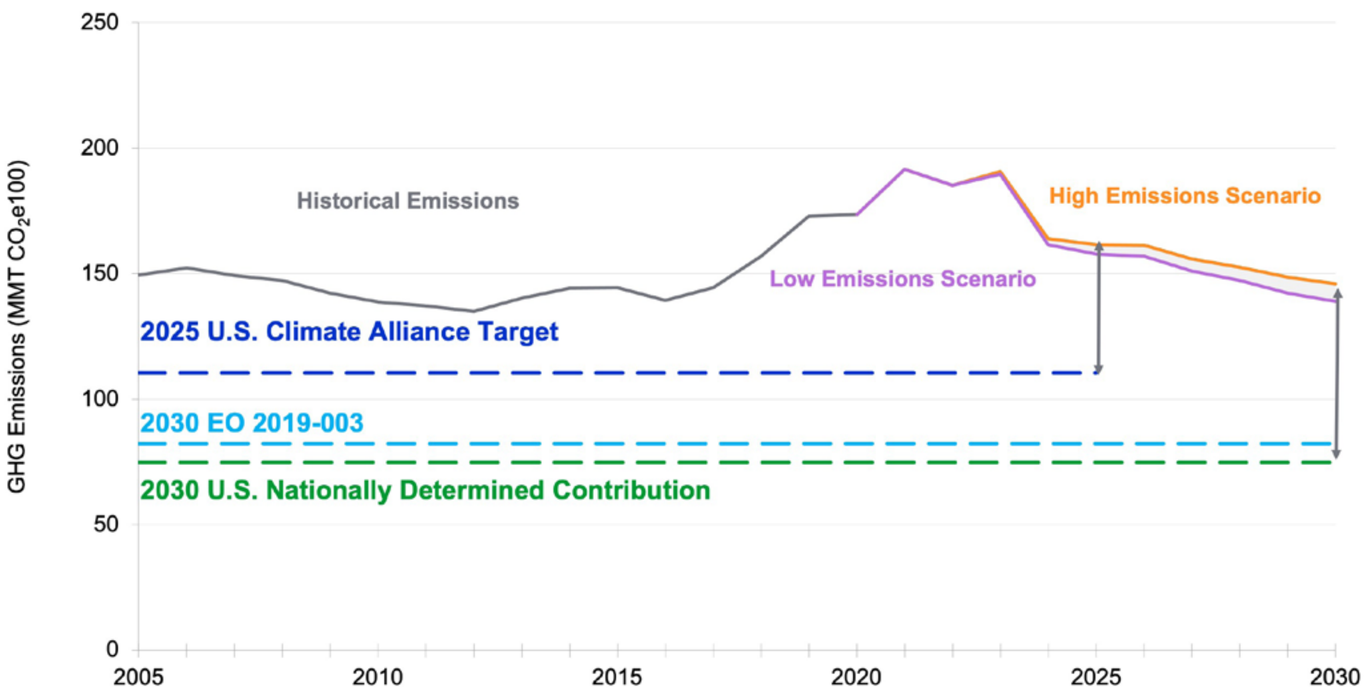
Figure 5: New Mexico Economy-Wide GHG Emissions and Targets Using AR6 100-year GWP



Using the AR6 100-year GWP values slightly increases total emissions compared to the AR5 100-year GWP. However, the emissions targets increase as well because the baseline emissions are higher, so while the emissions gaps are slightly wider using the AR6 100-year GWP, the emissions gaps are not significantly changed.

Figure 6 below shows GHG emissions using the AR6 20-year GWP values to estimate emissions on a carbon dioxide-equivalent basis.

Figure 6: New Mexico Economy-Wide GHG Emissions and Targets Using AR6 20-year GWP



Using AR6 20-year GWP values results in higher CO_2e values compared to estimates based on 100-year GWP values, because methane's GWP is three times higher over the 20-year time horizon. Business-as-usual emissions also do not fall by as much between 2005 and 2030 as most of the reductions seen in Figure 3 and Figure 4 above are from reductions in carbon dioxide. Methane emissions are projected to increase through 2030, and because the GWP value for methane is much higher on a 20-year timescale than a 100-year timescale, the contribution of methane to total emissions on a carbon dioxide-equivalent basis causes overall emissions to increase.

While the emissions targets also increase using the AR6 20-year GWP value, the emissions gaps are considerably wider compared to the 100-year GWP value estimates. Again, using the more recent AR6 GWP values or using 20-year GWPs would not change the overall conclusions of this report. However, because limiting damages from climate change over the next few decades as well as over the next century requires immediate cuts to emissions of both short- and long-lived climate pollutants, we believe the state should consider establishing separate emission reduction targets for methane and carbon dioxide. New Mexico is a major emitter of methane, the most prominent short-lived climate pollutant, which has a more pronounced warming effect on the climate over several decades after it is emitted.[65] Carbon dioxide can remain in the atmosphere for hundreds of years,[66] so CO_2 emissions entering the atmosphere over the next decade will continue to warm the planet for centuries to come. In order to address climate change damages over all timescales, it is critical to reduce emissions of both gases as quickly as possible.

Targets that aggregate all greenhouse gases require a metric to compare the climate impacts of different pollutants over a specific timescale — masking the impact of pollutants over other timescales. For example, using a 100-year GWP metric masks the near-term warming impact of methane,[67] which is over 80 times more potent than carbon dioxide on a 20-year timescale in terms of its warming effect on the atmosphere.[68,69] Conversely, while using the 20-year GWP is a suitable proxy for capturing near-term climate impacts of greenhouse gases, it has the unintended consequence of deemphasizing long-term climate impacts, and thus could downplay the importance of carbon dioxide reductions. Therefore, to place equal emphasis on the importance of reducing emissions of both gases, EDF recommends establishing separate targets for methane and carbon dioxide that align with states' overall reduction targets. Targets for both gases should ensure that emissions decline on a timeline consistent with the trajectory needed to limit warming as much as possible.[70]

65 Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf.

66 Id.

67 Ocko, IB, SP Hamburg, DJ Jacob, DW Keith, NO Keohane, M Oppenheimer, JD Roy-Mayhew, DP Schrag, SW Pacala, Unmask temporal trade-offs in climate policy debates, Science, 356, 6337, p.492-493 (2017).

68 Forster, P., T. Storelvmo, K. Armour, W. Collins, J.-L. Dufresne, D. Frame, D.J. Lunt, T. Mauritsen, M.D. Palmer, M. Watanabe, M. Wild, and H. Zhang, 2021: The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 923–1054, doi:10.1017/9781009157896.009.

69 See Appendix XX for an analysis of New Mexico's progress toward its climate commitments if a 20-year timescale is used rather than a 100-year timescale.

70 IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5 °C. An IPCC Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. https://archive.ipcc.ch/pdf/special-reports/sr15/sr15_spm_final.pdf.